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FIELD INVESTIGATION PHOTOGRAPH ALBUM

OPERABLE UNIT NO. 7
(SITES 1, 28 AND 30)

MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

CONTRACT TASK ORDER 0231

JULY 29, 1994

Prepared For:

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LIST OF ACRONYMS AND ABBREVIATIONS

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DEHNR	North Carolina Department of Environment, Health, and Natural Resources
DoN	Department of the Navy
EPIC	Environmental Photographic Interpretation Center
FCLDA	French Creek Liquid Disposal Area
FFA	Federal Facilities Agreement
FTSA	Fuel Tank Sludge Area
HPBD	Hadnot Point Burn Dump
HPIA	Hadnot Point Industrial Area
MCB	Marine Corps Base
NPL	National Priorities List
OU	Operable Unit
POL	Petroleum, Oil, and Lubricants
RCRA	Resource Conservation and Recovery Act
STP	Sewage Treatment Plant
TCLP	Toxicity Characteristic Leaching Procedure
USEPA	United States Environmental Protection Agency

1.0 INTRODUCTION

Marine Corps Base (MCB) Camp Lejeune was placed on the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) National Priorities List (NPL) effective November 4, 1989 (54 Federal Register 41015, 1989). Subsequent to this listing, the United States Environmental Protection Agency (EPA) Region IV, the North Carolina Department of Environment, Health, and Natural Resources (DEHNR), and the United States Department of the Navy (DoN) entered into a Federal Facilities Agreement (FFA) for MCB, Camp Lejeune.

The FFA included the implementation of a remedial investigation/feasibility study (RI/FS) at sites throughout MCB Camp Lejeune. This Field Investigation Photograph Album describes the RI field activities that have been conducted at three of the sites. These sites include: Site 1 (French Creek Liquids Disposal Area), Site 28 (Hadnot Point Burn Dump), and Site 30 (Sneads Ferry Road Fuel Tank Sludge Area). The three sites comprise Operable Unit (OU) No. 7 (see Figure 1-1).

1.1 Purpose and Format of the Field Investigation Photograph Album

The primary purpose of the Field Investigation Photograph Album is to provide the Navy and Marine Corps with an overview of the RI field activities that have been conducted at MCB Camp Lejeune, OU No. 7 (Sites 1, 28, and 30). The field investigation was conducted by Baker Environmental, Inc. (Baker) for the DoN during March through May of 1994. This album contains photographs of the sites and the various field investigations that were conducted during the 1994 RI.

The Field Investigation Photograph Album is formatted to allow ease of review. Section 1.0 provides the introduction, purpose, and format of the photograph album. Section 2.0 provides a brief description of the sites and a summary of the known or suspected waste disposal activities. Photographs have been included within Section 2.0 that illustrate present site conditions. Section 3.0 describes the various field investigations conducted at OU No.7. Representative photographs of all field investigation activities (e.g., Soil Investigation, Groundwater Investigation) are included in this section. Corresponding 35 millimeter color slides of all photographs contained in this album are provided in Appendix A.

Each field investigation photograph has been designated, with a unique number. The photograph designation format is:

Operable Unit #. Site # or Investigation. Year. Photograph #.

An explanation of each identifier is given below.

Operable Unit #:	The field investigation was conducted at Operable Unit No. 7.
Site #:	The field investigation was conducted at Sites 1, 28, and 30, the three sites that comprise OU No. 7.
Investigation:	GW = Groundwater Investigation SL = Soil Investigation SD = Sediment Investigation AQ = Aquatic Investigation
Year:	The field investigation was conducted during 1994.
Photograph #:	The photograph number indicates the sequential order of photographs grouped according to Site # or Investigation.

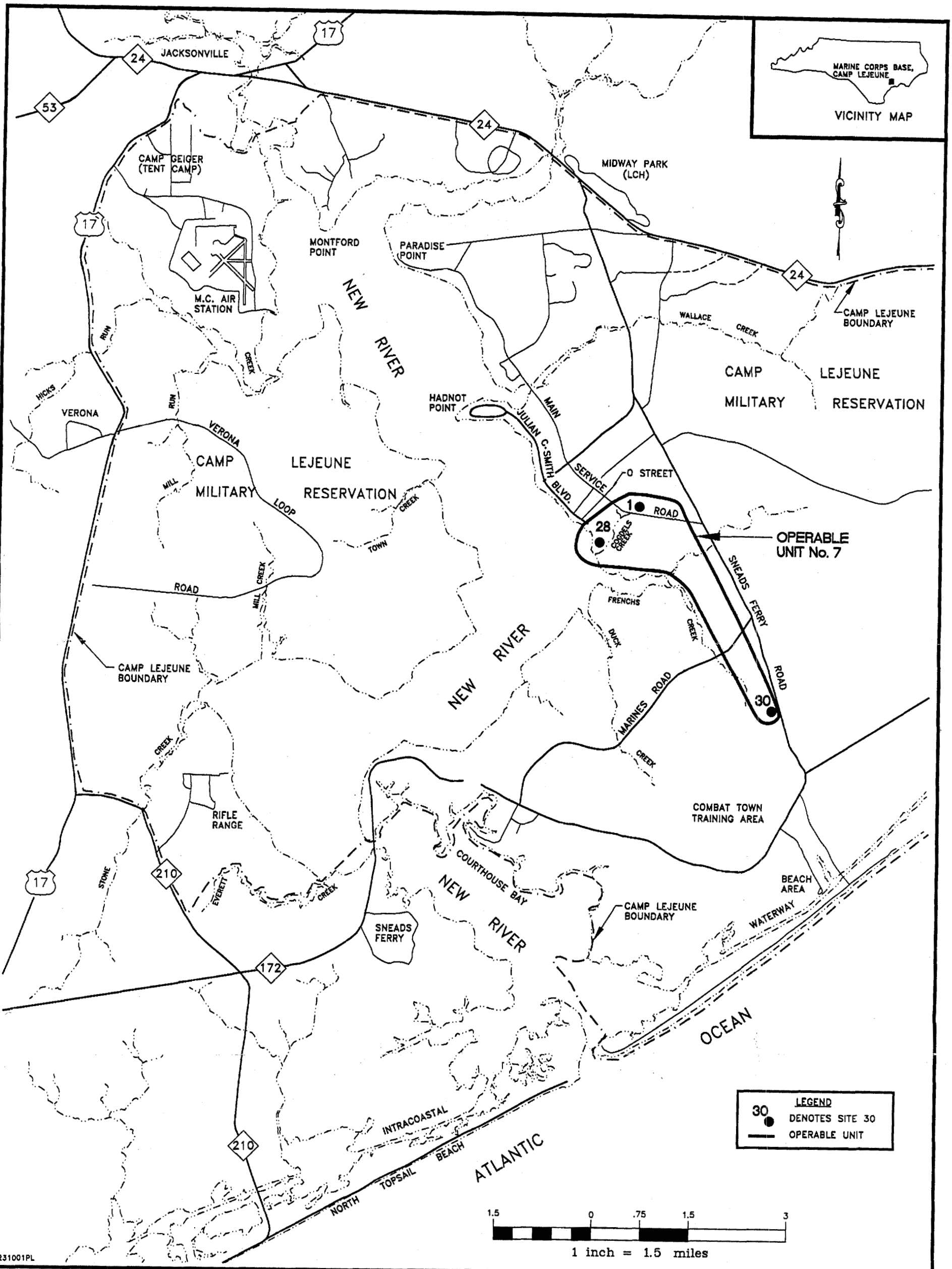

FIGURE 1–1
OPERABLE UNIT No. 7 – SITES 1, 28, AND 30
MARINE CORPS BASE CAMP LEJEUNE

MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

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2.0 SITE CHARACTERISTICS

This section provides a description of the site location, setting, and a brief history of waste disposal activities for OU No.7, Sites 1, 28, and 30.

2.1 Site 1 (French Creek Liquids Disposal Area)

2.1.1 Site Location and Setting

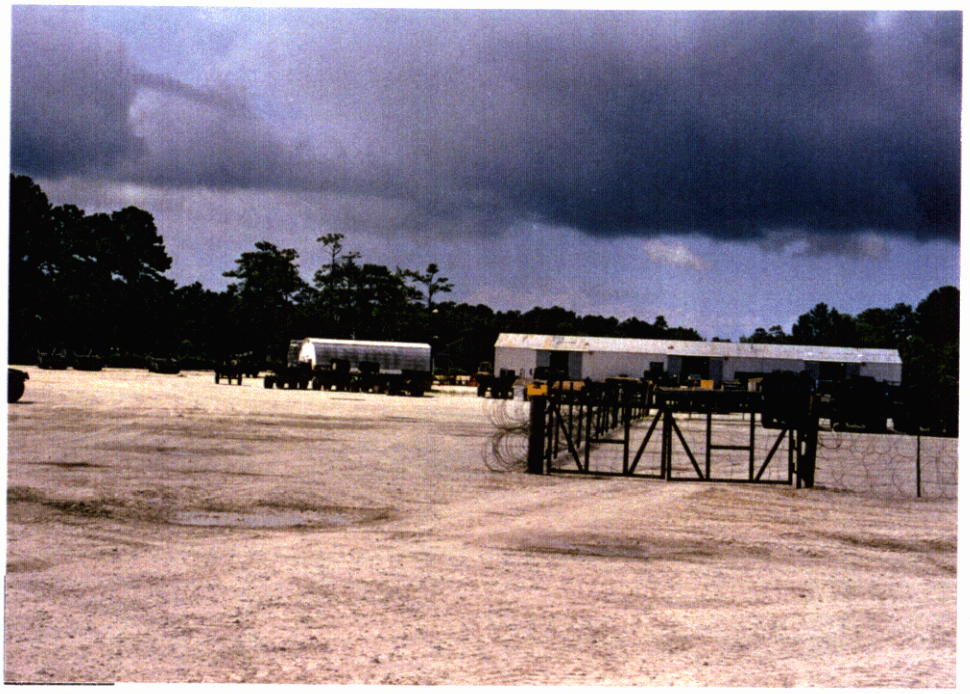
Site 1 - French Creek Liquids Disposal Area (FCLDA) is located approximately one mile east of the New River and one mile southeast of the Hadnot Point Industrial Area (HPIA) on the Mainside portion of Camp Lejeune (see Figure 1-1). The site is situated on both the north and south sides of Main Service Road near the western edge of the Gun Park Area and Force Troops Complex. The southern half of the site is bordered by Daly Road to the east and H.M.Smith Boulevard to the south. The total area of this site is estimated to be between seven and eight acres.

The majority of Site 1 is comprised of paved or improved (i.e. coarse gravel) road surface, parking lots, storage lots and equipment wash racks. Much of the suspected northern disposal area is within two fenced compounds, the remaining portion of the northern disposal area is located to the north of these fenced compounds. Vehicle access to the suspected southern disposal area is through a swing-arm gate along Main Service Road. A portion of the southern disposal area is surrounded by a barbed-wire fence, the remaining portion is not fenced. Lawn and wooded areas border the site to the north, east, and west.

2.1.2 Site History

Site 1 has been used by several different mechanized, armored, and artillery units since the 1940s. Liquid wastes generated from the maintenance of mechanized vehicles were routinely poured onto the ground surface. These wastes have been reported to be primarily petroleum, oil, and lubricants (POL). In addition, spent battery acid was also reported to have been poured onto the ground. Quantities have been estimated to be between 5,000 and 20,000 gallons of POL waste and between 1,000 and 10,000 gallons of battery acid waste (ESE, 1990). The site continues to serve as a vehicle and equipment maintenance and staging area.

SITE 1



OU7.Site01.1994.01: This photograph was taken facing south from Main Service Road, across the Motor Transport Lot at Site 1.

OU7.Site01.1994.02: This is the view from H.M. Smith Boulevard facing northwest across an adjacent picnic area, toward the Motor Transport Lot.

OU7.Site01.1994.03: The drums and containers, pictured in foreground, contain fuel and lubricants used to maintain vehicles and equipment.

OU7.Site01.1994.04: Building FC-120, pictured here, serves as a transport vehicle and equipment maintenance facility for the Landing Support Battalion. The building is situated along the north side of Main Service Road.

SITE 1

OU7.Site01.1994.05: This vehicle maintenance ramp and materials storage area are located on the south side of Main Service Road, adjacent to Building FC-739.

OU7.Site01.1994.06: This photograph shows another vehicle maintenance ramp and a materials storage locker also located within the southern half of Site 1.

OU7.Site01.1994.07: This vehicle and equipment wash basin is located near H.M. Smith Boulevard on the south side of Site 1. Liquids from the wash basin flow into an oil/water separator (metal grate in background).

OU7.Site01.1994.08: This photograph was taken facing north from within the secured area surrounding Building FC-120. The liquids from this vehicle and equipment wash basin (in the foreground), are also fed through an oil/water separator (see photograph 07.01.1994.09).

SITE 1

OU7.Site01.1994.09: This oil/water separator serves the Building FC-120 maintenance complex, on the northern side of Site 1.

OU7.Site01.1994.10: This temporary storage area is used to store maintenance fluids. The storage area is located within the Building FC-120 complex.

OU7.Site 01.1994.11: The two storage tanks shown are used to store kerosene for use as heating fuel. A number of additional buildings, located on the southern half of Site 1, use kerosene from similar tanks.

OU7.Site 01.1994.12: These three above ground storage tanks are used to store spent maintenance fluids. The tanks are located atop the site of a former 1,000 gallon underground storage tank (GTGS, 1993), adjacent to Building FC-120.

2.2 Site 28 (Hadnot Point Burn Dump)

2.2.1 Site Location and Setting

Site 28 - Hadnot Point Burn Dump (HPBD) is located on the Mainside portion of MCB Camp Lejeune, adjacent to the Mainside Sewage Treatment Plant (STP). Vehicle access to the site is via Julian C. Smith Boulevard, near its intersection with O Street. The site is bordered to the north and east by wooded areas and to the southwest by the New River. Cogdels Creek forms a natural divide between the eastern and western portions of the site. Two 18-inch diameter aqueducts extend across Cogdels Creek and serve an aeration pond located on the eastern portion of the site.

The site is approximately 23 acres in size and is comprised of two lawn/recreation areas, served by an improved gravel road. The Mainside STP includes a number of clarifying, settling, and aeration ponds that are located on either side of Cogdels Creek. Both operational areas of the STP are fenced with six-foot high chain link.

2.2.2 Site History

The HPBD operated from 1946 to 1971 as a burn area for a variety of solid wastes generated on base. Industrial waste, refuse and construction debris was burned and subsequently covered with soil. In 1971 the burn dump ceased operations, was graded, and was seeded with grass. The total volume of fill is estimated to be between 185,000 and 375,000 cubic yards (ESE, 1990).

The site is currently used as a recreational area which includes a stocked fish pond. The Orde Pond Recreation Area also has a number of picnic pavilions and playground equipment. Field exercises and physical training activities frequently take place at the recreation area.

OU7.Site28.1994.01 This photograph was taken facing northwest looking toward the picnic pavilion area, on the western portion of Site 28.

OU7.Site28.1994.02 This is a view of another picnic pavilion on the western portion of the site. Photograph taken facing east.

SITE 28

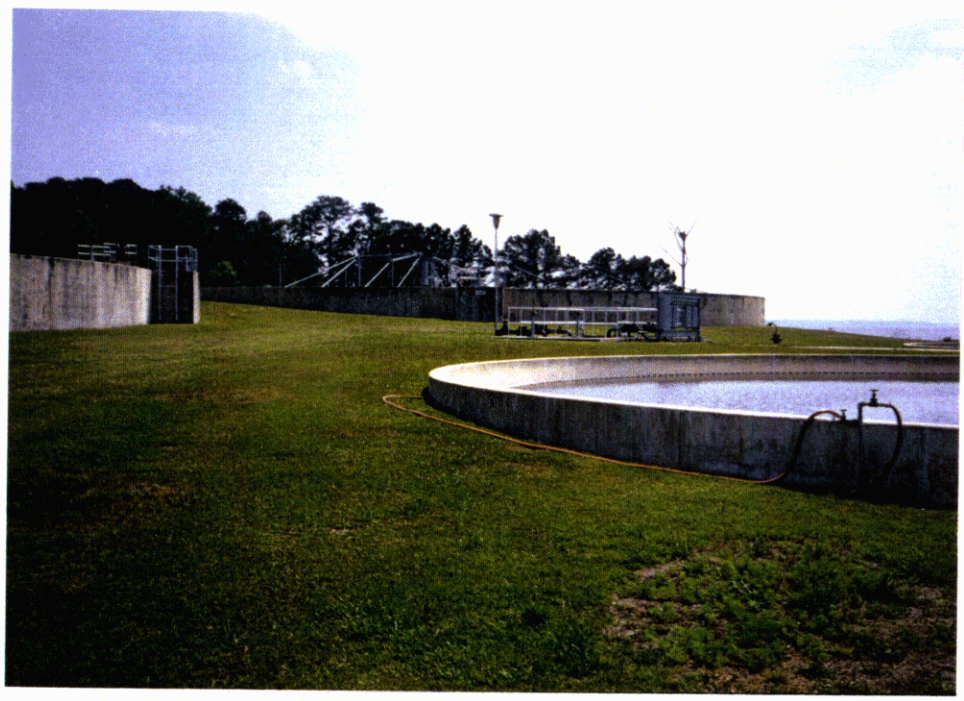
OU7.Site28.1994.03

Site 28 as seen facing southwest from the western picnic pavillion area toward the New River.

OU7.Site28.1994.04 Orde Pond, pictured here, lies on the eastern portion of Site 28.

OU7.Site28.1994.05 This photograph was taken facing northeast, toward Orde Pond, across the eastern picnic pavilion area.

OU7.Site28.1994.06 The Mainside Sewage Treatment Plant (STP), extends from the western portion of the site across Cogdels Creek (see Photograph 07.28.1994.09).



OU7.Site28.1994.07 This photograph was taken facing southwest from the Mainside STP clarifying pond area toward the New River.

OU7.Site28.1994.08 This is a view of the Orde Pond gravel access road and two Mainside STP transmission lines.

OU7.Site28.1994.09 The two transmission lines, pictured here, serve an aeration pond located at the easternmost extent of the Mainside STP facility. The transmission lines cross Cogdels Creek at this location.

SITE 28

OU7.Site28.1994.10 This photograph was taken facing southwest from O Street, toward the Mainside STP.

OU7.Site28.1994.11 Metallic debris, asphalt, bricks, and concrete rubble can be seen eroding from the cut bank along the New River.

2.3 Site 30 (Sneads Ferry Road Fuel Tank Sludge Area)

2.3.1 Site Location and Setting

Site 30 - Sneads Ferry Road Fuel Tank Sludge Area (FTSA) is located along a tank trail which intersects Sneads Ferry Road from the southwest, approximately 6,000 feet south of the intersection with Marines Road. One of two streams which comprise the headwaters of French Creek lie approximately 1,500 feet west of the site. The site is located approximately 3,000 feet northeast of the Combat Town Training Area. Wooded areas and unimproved paths both surround and are found within Site 30.

2.3.2 Site History

Sludge from fuel tanks that were used to store leaded gasoline (which contained tetraethyl lead and related compounds) and wastewater from the washout of these tanks were disposed of at this site by a private contractor. It is estimated that, at a minimum, 600 gallons of sludge was removed from tanks during the cleaning process. This estimate is based on the projected volume of material remaining in two 12,000 gallon tanks and the amount of material above their outflow ports. An additional amount of washout water is likely to have been disposed also. Other reports suggest that the site may have been used for the disposal of similar wastes from other offsite tanks. The composition of the waste is unknown but is likely to contain gasoline constituents and cleansing compounds (ESE, 1990).

SITE 30

OU7.Site30.1994.01 This photograph was taken facing southeast from Sneads Ferry Road toward Site 30.

OU7.Site30.1994.02 This is the view from Sneads Ferry Road facing southwest toward the center of the site. The road leading to the site is unimproved.

OU7.Site30.1994.03 This photograph depicts the amount of vegetative growth and understory at Site 30. Monitoring well 30-GW01 is pictured in the foreground.

OU7.Site30.1994.04 Facing north toward the site access road, this photograph was taken from within the suspected disposal area.

3.0 FIELD INVESTIGATIONS

3.1 Site-Specific Investigations

This subsection describes the specific investigations that were conducted at each of the three sites.

3.1.1 Site 1 Investigation

The various sampling and investigation programs conducted at Site 1 included both groundwater and soil investigations. The groundwater investigation involved the installation of nine shallow and two deep monitoring wells. Potential impacts to groundwater, as a result of past disposal activities, were evaluated through laboratory analyses of collected groundwater samples which were obtained from a total of 16 shallow wells (7 existing and 9 newly installed), two deep wells, and one water supply well.

The soil investigation focused on the suspected battery acid and POL disposal areas. Sampling grids were surveyed throughout these areas to identify locations for the collection of representative samples in each of the suspected areas. Surface and subsurface soil samples were retained from 39 soil borings and 11 well locations.

3.1.2 Site 28 Investigation

The sampling and investigation programs conducted at Site 28 included: a groundwater investigation; a soil investigation; a surface water and sediment investigation; and an aquatic/ecological investigation. The groundwater investigation focused on determining the water quality of both the shallow and deep aquifers. As part of the RI, seven shallow (including two temporary) wells and three deep wells were constructed. A total of 14 groundwater samples were collected and submitted for laboratory analysis.

The soil investigation sought to evaluate areas of suspected disposal activities identified on historical aerial photographs and by previous investigations. A total of 40 test borings were advanced and soil samples were submitted from discrete sampling intervals for laboratory analysis.

The surface water, sediment, and the aquatic/ecological investigations were conducted in Cogdels Creek, Orde Pond, and the New River.

3.1.3 Site 30 Investigation

A soil investigation and groundwater investigation were conducted at Site 30. A surface water and sediment investigation of French Creek, which is located approximately 1,500 feet to the west of Site 30, was also conducted. One shallow well and one piezometer were installed during the groundwater investigation. A total of three groundwater samples were submitted for laboratory analysis from both existing and newly installed monitoring wells. The soil investigation involved the collection of surface and subsurface soil samples from 20 soil borings and one monitoring well location. A sampling grid approach was used to assess the extent of soil contamination.

3.2 General Investigations

This section describes the general investigative procedures employed during the field program.

3.2.1 Groundwater Investigation

Groundwater investigations were conducted at Sites 1, 28, and 30 in order to characterize potential groundwater contamination, assess human health and ecological risks, and allow the evaluation of possible remedial technologies. Monitoring wells were installed to evaluate groundwater quality and to estimate aquifer characteristics such as flow rates and flow direction. Well locations were selected based upon areas of concern identified on historical (EPIC) aerial photographs, previous investigations, and background information regarding the history and usage of the site.

Monitoring wells were constructed of two-inch PVC casing with a 0.01-inch slotted screen. Outer steel casing was employed during deep well installation (i.e., Type III wells) where conditions mandated, (such as the occurrence of a confining clay layer or unconsolidated sand layer). A medium grained sand pack (No. 1 sand) was placed between the borehole wall and screen extending approximately 2 feet above the top of the screen. A 2- to 3-foot bentonite pellet seal was then placed above the sand pack. In the case of deep wells, bentonite/cement was employed as backfill. The remaining annular space was then backfilled with Portland

cement and a surface pad was constructed. Finally, an above ground steel protective casing and a PVC locking cap were installed at the top of each well.

Following well construction, each well was developed in order to remove fine-grained sediments and to establish a hydraulic connection between the well and the formation. The newly installed monitoring wells were developed using a combination of pumping and surging (shallow wells), or air-compressed evacuation and surging (deep wells). Investigation-derived wastes generated during this investigation (e.g., purge water, development water, drilling mud) were containerized and sampled for assessment of disposal options.

Groundwater samples were collected from both newly installed and existing monitoring wells. Groundwater sampling procedures were performed in accordance with USEPA Region IV guidelines.

OU7.GW.1994.01: These personnel are in the process of installing a groundwater monitoring well at Site 30.

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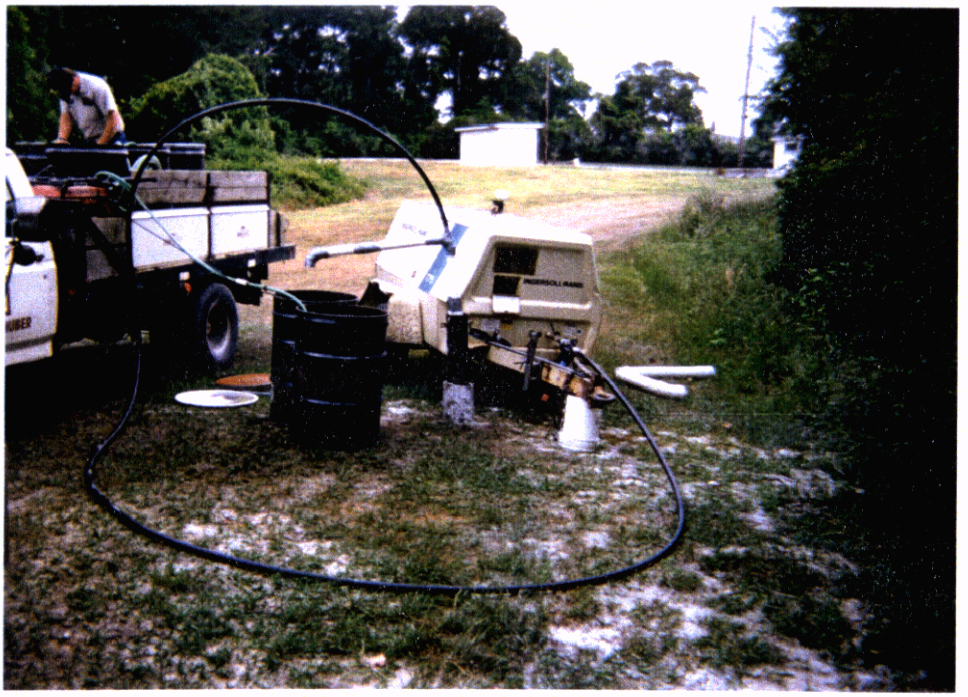
OU7.GW.1994.02: This photograph depicts the installation of a temporary monitoring well, 28-TGWPA, at Site 28. Due to the nature of unconsolidated fill material and buried debris, a permanent well at this location was not feasible.



OU7.GW.1994.03: Deep groundwater monitoring wells were developed using the compressed air system pictured here. The high density polyethylene (HDPE) tubing was used once and discarded.

OU7.GW.1994.04: This supply well, 1-HP-638, was sampled as part of the RI. The purge water is being monitored in this photograph for volatile organic compounds using a photoionization detector. Approximately three well volumes were purged in this manner prior to sampling.

OU7.GW.1994.05: This groundwater sample was collected at 1-HP-638, by reducing the flow velocity. The supply well is currently not connected to the base water system.

OU7.GW.1994.06: Monitoring well 1-GW05, as shown in this photograph, is in the process of being abandoned. During the RI two monitoring wells were abandoned, 1-GW05 and 28-GW01.

OU7.GW.1994.07: The first step in the abandonment process is the removal of the concrete pad, protective casing, and bollards as shown. Subsequently, the well riser and screen were removed and the borehole was overdrilled and grouted to the surface.

3.2.2 Soil Investigation

Soil investigations were conducted at Sites 1, 28, and 30 in order to characterize potential soil contamination, assess human health and ecological risks, and allow evaluation of possible remedial technologies. The drilling and sampling program focused on suspected disposal/storage areas. Historic (EPIC) aerial photographs, previous investigatory data, and background documents (e.g. memos, reports) were used to locate potential areas of concern.

Drilling operations employed a truck mounted drill rig and the use of hollow-stem augers. Surface (i.e., 0 to 12 inches) and subsurface soil samples were collected to evaluate the horizontal and vertical extent of potentially impacted soils. Surface soil samples were collected using a decontaminated stainless-steel spoon. Deeper subsurface soil samples were collected with a decontaminated split-spoon sampler. Soil sampling was conducted in accordance with USEPA Region IV guidelines. Drill cuttings were containerized, sampled and analyzed in order to evaluate disposal options.

In addition to organic and metal chemical analyses, a limited number of samples were collected and analyzed for both geotechnical and chemical engineering parameters. Chemical parameters (total TCLP and RCRA hazardous characteristics) were analyzed in order to evaluate process and disposal options for treatment of potentially impacted soils. Geotechnical parameters (grain size, Atterberg limits) were collected for evaluation of subsurface physical conditions.

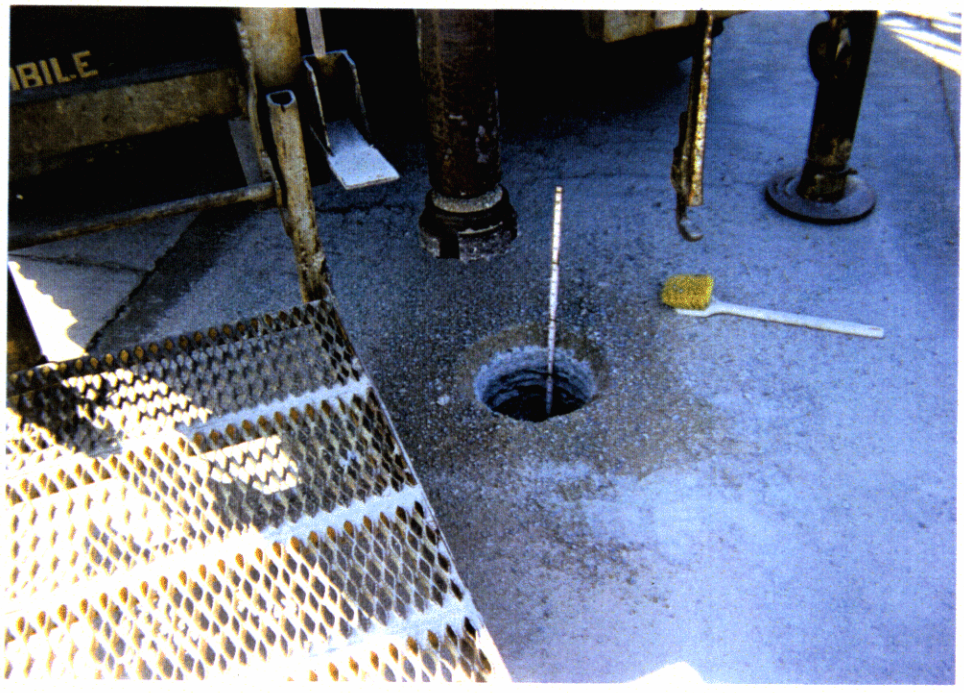
OU7.SL.1994.01: This photograph depicts soil investigation operations at Site 1 (Building FC-134 is pictured in the background). A dedicated auger was used to drill through the asphalt and then another decontaminated auger was used to drill to the desired sampling depth.

OU7.SL.1994.02: The personnel in this photograph are collecting soil samples at Site 28 adjacent to Orde Pond.

OU7.SL.1994.03: This cabling was unearthed from the western disposal area within Site 28.

OU7.SL.1994.04: This metallic debris was also unearthed from the western disposal area at Site 28.

OU7.GW.1994.05: This photograph shows more cable material unearthed from the western disposal area at Site 28.



OU7.SL.1994.06: A ten-inch rotary hammer, pictured here, was used to break through the reinforced concrete slab adjacent to Building FC-120 at Site 1. An auger was used to drill to the desired sampling depth.

OU7.SL.1994.07: All asphalt and concrete borings were patched with the appropriate patching material.

3.2.3 Surface Water and Sediment Investigations

Surface water and sediment investigations were conducted at Sites 28 and 30 in order to characterize potential contamination, assess human health and ecological risks, and allow evaluation of possible remedial technologies. Environmental samples were collected to assess whether contaminants may have migrated to various bodies of water with surface runoff or groundwater discharge.

One surface water sample and two sediment samples (surface and subsurface) were collected at each sampling station. Surface water samples were collected by dipping the sample bottles directly into the water. Sediment samples were collected by driving a sediment corer, equipped with a plastic disposable tube, into the sediments.

All samples were analyzed for organic and metal parameters.

OU7.SD.1994.01: The personnel in this photograph are using a stainless steel, hand-held, coring instrument, fitted with a disposable plastic liner tube and eggshell catcher to collect sediment samples at Orde Pond, Site 28.

OU7.SD.1994.02: The discrete-depth sediment sample is extruded from the plastic liner tube as shown, using a decontaminated brass extruder.

3.2.4 Aquatic/Ecological Investigation

Aquatic/Ecological surveys were conducted on Cogdels Creek, Orde Pond, and the New River. These surveys were performed in order to evaluate whether possible contaminant migration from the sites near these waterways has adversely impacted aquatic habitat.

The surveys included benthic macroinvertebrate studies, and fish and crab population studies. Sampling stations were chosen upgradient from the sites to assess background conditions, as well as adjacent to and downgradient from the sites in order to evaluate any ecological stresses.

Benthic macroinvertebrates were collected using ponar dredges. Fish were collected using electroshocking, gill nets, and haul seines. Following the collection of benthic macroinvertebrates and fish from sampling stations, the organisms were identified and counted. Abnormal markings such as tumors or lesions were noted. Statistical summaries were performed in order to approximate faunal densities, species richness, and species diversity. These parameters are used to evaluate stresses to the environment.

A limited number of fish and crab were collected for chemical analysis in order to evaluate whether contaminants in the surface water or sediment have bioaccumulated in the organisms. Heavy metals such as mercury and lead, along with PCBs and pesticides, can easily bioaccumulate in organisms from ingestion.

OU7.AQ.1994.01 The personnel in this photograph are using a gill net to collect fish specimens from the New River adjacent to Site 28.

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APPENDIX A
SLIDES